







## Evolution of Galapagos Island Finches

The finches on the Galapagos Islands look so different from one another that when Darwin first saw them, he did not realize they were all finches. The species he examined varied in the sizes and shapes of their beaks and in their feeding habits, as shown in Figure 1.

**Figure 1 Characteristics of Galapagos Island Finches**

Galápagos Islands Finches						
Shape of Head and Beak						
Common Name of Finch Species	Vegetarian tree finch	Large insectivorous tree finch	Woodpecker finch	Cactus ground finch	Sharp-beaked ground finch	Large ground finch
Main Food	Fruits	Insects	Insects	Cacti	Seeds	Seeds
Feeding Adaptation	Parrotlike beak	Grasping beak	Uses cactus spines	Large crushing beak	Pointed crushing beak	Large crushing beak
Habitat	Trees	Trees	Trees	Ground	Ground	Ground

1. [SP 3] Propose a hypothesis to explain the variety of finches found on the islands.
2. [SP 3, SP 6] Suggest a problem with testing your hypothesis.
3. [SP 1] Describe the relationship between the size and shape of the beak and the food source of a particular finch species.
4. [SP 1] When a physical trait or behavior results in increased fitness, it is called an adaptation. Identify two adaptations in the finches on the Galapagos Islands.

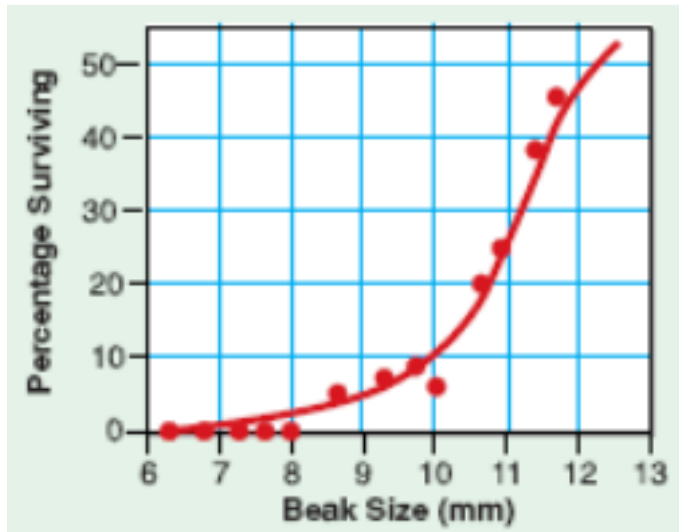
Peter and Rosemary Grant from Princeton University spent twenty years studying the finches to test the hypothesis that natural selection could account for the variety Darwin observed. They studied one species of finch by catching and identifying nearly every single bird of that species on one of the islands. Each year they recorded which birds were still alive and which had died, which had been successful in breeding and which had not. For each bird they also recorded wing length, leg length, beak length, beak depth, beak color, feather color, and body mass.

During the rainy season food is plentiful, and finches will eat whatever is most available. During a drought, however, some foods are scarce.

5. [SP 1, SP 6] Explain why the observation that some food sources were scarce during a drought was important for demonstrating that natural selection could account for the variety in finch beaks.

Over the twenty-year period of their study, the Grants collected data on beak size during periods of drought on the island. Their data are shown in Figure 2.

**Figure 2 Survival of finches and beak size**



6. [SP 4] Use the graph to make a claim about the size of finch beaks during droughts.
7. [SP 1, SP 4, SP 6] The Grants claimed that the variety of finch beaks could be explained by natural selection. Explain how their work supports that claim.
8. [SP 1] Darwin noticed that different finches were found on different islands. From what you know about how speciation happens, propose an explanation for this observation.
9. [SP 1] Suggest a reason the finches were important in shaping Darwin's ideas about natural selection.